P1800 SV-AC Erratum 0000230 (JH: Simplify clock resolution using clock flow)

Description

Section 17.14 is unnecessarily complicated and the resolution tables have some errors and ambiguities.

The general clock flow principle can be used to resolve clocks for sequences and properties. An outer clocks will apply unless it is superseded by an inner clock. If the sequence or property is in the scope of a default clock, then the default clock is considered the outermost clock. Within the default clock can be either a contextually inferred clock from a procedural block, a clocking block clock, or an explicit clock.

Suggested Resolution

Section 17.14.1, p. 257. Delete the sentence

> On the other hand, if a property has only explicit semantic leading clocks, then the incoming outer clock has no effect on the clocking of the property since the explicit clock events replace the incoming outer clock.

RATIONALE: This sentence is false because clocks do not flow out of parentheses or out of instances. The semantic leading clocks can be explicit even though part of the property is still unclocked.

Section 17.14, pp. 253-255. Replace the text beginning

> For a multi-clocked assertion, the clocks are explicitly specified. No default clock or inferred clock is used.

and continuing to the end of Section 17.14 with the text below.

In general, a clocking event applies throughout its scope except where superseded by an inner clocking event, in analogy with clock flow in multiply-clocked sequences and properties. The following rules apply.

1. A default clocking event, if defined, is treated as the outermost clocking event and will apply if no other leading clocking event is specified.

In a module, interface, or program with a default clocking event, all sequence declarations, property declarations, and concurrent assertion statements that have no otherwise specified leading clocking event are treated as though the default clocking event had been written explicitly as the leading clocking event.

2. The clocking event of a clocking block supersedes a default clocking event throughout the clocking block. The following additional rules apply within a clocking block.

   (a) No explicit clocking event is allowed in any property or sequence declaration within the clocking block. All sequence and property declarations within the clocking block are treated as though the clocking event of the clocking block had been written explicitly as the leading clocking event.

   (b) Multiply-clocked sequences and properties are not allowed within the clocking block.

   (c) If a named sequence or property that is declared outside the clocking block is instantiated within the clocking block, the instance must be singly-clocked and its clocking event must be identical to that of the clocking block.

3. A contextually inferred clocking event from a procedural block supersedes a default clocking event. The contextually inferred clocking event is treated as though it had been written as the leading clocking event of any concurrent assertion statement to which the inferred clock applies. The maximal property of such a concurrent assertion statement must be singly-clocked.

4. An explicitly specified leading clocking event in the declaration of a sequence or property or in a concurrent assertion statement supersedes a default clocking event.

5. A multiply-clocked sequence or property can inherit the default clocking event as its leading clocking event. If a multiply-clocked property is the maximal property of a concurrent assertion statement, then the property must have a unique semantic leading clock (see 17.14.1).

6. In the absence of a default clocking event, the leading clocking event of the maximal property of a concurrent assertion statement must be specified by one of the preceding mechanisms (clocking block, contextually inferred, explicit). If there is no leading clocking event written explicitly in the concurrent assertion statement, then the the property_expr of the property_spec of the assertion must be either a sequence_instance or a property_instance and a unique leading clock event must be determined for the instance.